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Contract to develop sugar cube-sized power source

by Francis L. Crumb, Information Directorate

ROME, N.Y. — It will never power a car to victory at the Indy 500, but the miniature engine being sought by the Air Force Research Laboratory Information Directorate promises to be a winner.

Acting as an agent for the Defense Advanced Research Projects Agency (DARPA) of Arlington, Va., the directorate awarded a $2,399,100 contract to Honeywell Technology Center of Plymouth, Minn., for development of an internal combustion engine no larger than a sugar cube.

Under terms of the three-year agreement, Honeywell engineers will produce and demonstrate the tiny power source. Microelectromechanical systems is a revolutionary application of micromachining that creates mechanically active micro-structures for sensing or actuating. Initial research for these "machines-on-a-chip" has relied on mature silicon fabrication technology.

"We will be getting an internal combustion engine and generator system that takes up the space of one cubic centimeter, excluding the fuel tank," said Walter A. Koziarz, program manager in the directorate's Information Technology Division. "The engine and generator will be capable of producing 10 watts of electrical power."

Koziarz said the most likely fuel source will be butane, which has approximately 10 times the energy density of today's best batteries. The system could be refueled in less than one minute, as contrasted to an hour or longer to recharge batteries.

"Potential uses for this miniature engine and generator include elimination of batteries in portable future battlefield information systems, unattended sensor arrays and lap-top computers," Koziarz said. "You could either run more powerful items than current batteries allow or realize a much longer period between replacement or recharge." **@**